

## A Structural Model of Depression Based on Interpersonal Relationships: The Mediating Role of Coping Strategies and Loneliness

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### ABSTRACT

**Introduction:** The present study was conducted with the aim of examining the structural model of interpersonal relationships and depression using coping strategies and loneliness as mediators.

**Methods:** Using multistage random sampling, 301 high-school students were selected from Minudasht city, Iran. The participants were asked to complete the Network of Relationships Inventory (NRI); the Ways of Coping Questionnaire (Lazarus and Folkman); the Children's Loneliness Scale (CLS); and the Depression, Anxiety, and Stress Scale (DASS-21). Structural equation modeling was used to examine the pattern of direct and indirect effects.

**Results:** Findings of the present study show that the data are well fitted to the model. The indirect effect of the positive quality of relationships was significant on depression through loneliness. Moreover, the

indirect effects of the negative quality of relationships on depression through loneliness and through emotion-focused coping strategies were statistically significant. Although the effect of loneliness and emotion-focused coping strategies on depression was significant, problem-focused coping strategies did not have a significant effect on depression. Additionally, the findings suggested that the indirect effect through loneliness on depression was stronger compared with the indirect effect through emotion-focused coping strategies.

**Conclusion:** The positive or negative quality of interpersonal relationships, loneliness, and emotion-focused coping strategy can significantly predict depression.

**Keywords:** Depression, quality of interpersonal relationships, problem-focused coping strategy, emotion-focused coping strategy, loneliness

### INTRODUCTION

Depression is a multifactorial disorder with various causes such as personality, cognition, family background, or interpersonal relationships and it is very unlikely each one of these factors be responsible for depression development by themselves (1).

With the onset of adolescence, girls are reported to have depression at a rate two or three times higher than that in boys, with this sex difference remaining throughout their lives (2). Baumeister and Leary (3) believe that developing and continuing persistent interpersonal relationships is a fundamental human motivation. Also, research has consistently indicated that a low-quality of interpersonal relationships is associated with negative consequences on the mental health of young individuals (4,5). On the other hand, the positive qualities in parent-adolescent relations including high support, warmth and approval are correlated with lower levels of depression symptoms in adolescents (6,7,8). The importance of high-quality relationships with peers for young individuals' psychological well-being is a well-established issue (9). Conversely, studies investigating the way these positive and negative qualities are related to depression have not been considered. In a study, La Greca and Harrison (10) found that the presence of positive qualities in a relationship with a best friend protects the individual from social anxiety but not from depressive symptoms. They assumed that positive qualities such as support and self-disclosure are likely to cause the individual continue talking about the problem and focusing on negative feelings, leading to persistence of the depressive symptoms. They also demonstrated that a higher degree of negative quality significantly predicts social anxiety and depression. In the present study, we have assumed that the quality of relationships has a direct effect on depression.

Loneliness is another variable that affects depression. Peplau et al. (11) defined loneliness as the gap between the desirable and existing levels in an individual's social relations. According to Perlman, loneliness results from the distance and gap between the individual's ideals and achievements in interpersonal relationships and intimacy; the greater this distance the more intense the loneliness (12). Different studies revealed that loneliness positively correlates with internalized disorders, such as depression (13,14,15). Boivin and Hymel (16) found that loneliness has a mediating effect on a child's social conditions and consequences of depression. Based on these mediating and probable effects of social conditions on the quality of interpersonal relationships, it can be argued that loneliness can play a mediating role in the relation between the quality of interpersonal relationships and subsequent depressive symptoms.



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Coping strategies have recently attracted a considerable attention as a potential risk factor for depression. The vulnerability-stress framework states that acute stressful events in an individual's life and a chronic stressful environment can cause depression (17). Nevertheless, not all individuals who experience stressful events develop depression. Therefore, there is a defensive mechanism that prevents some individuals from experiencing depression; the fundamental differences in an individual's defensive system are the result of his or her personal characteristics (18). One of these characteristics is coping strategies, which are defined as individuals' emotional, cognitive, and behavioral attempts to lessen the effect of stressful events on their physical, social, and emotional functioning (19,20). According to Lazarus's theory, coping strategies are divided into two categories: problem-focused and emotion-focused (21). Jin et al. (18) found that coping strategies are mediating variables affecting the association between the family atmosphere and depression. Furthermore, a previous research has shown that coping strategies predict depression (19,22). Also, a significant correlation has been observed between problem-focused and emotion-focused coping strategies with depression in girls (23,24). Concerning these findings, it can be assumed that coping strategies play a mediating role in the structural relation between the quality of relationships and depression. We have hypothesized that problem-focused coping strategies play a mediating role in the structural relation between the positive quality of relationships and depression and that emotion-focused coping strategies play a mediating role in the structural relation between the negative quality of relationships and depression.

The present study aims at providing a model that represents the positive and negative effects of interpersonal relationships mediated by problem-focused and emotion-focused coping strategies and loneliness on depression in adolescents. In this model, it was hypothesized that the positive and negative qualities of interpersonal relationships directly affect depression while the quality of relationships indirectly affects depression through problem-focused and emotion-focused coping strategies and loneliness (Figure 1).

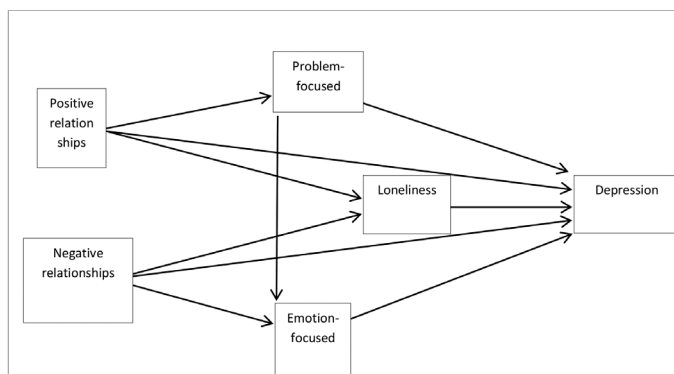
## METHODS

### Subjects

In total, 3201 female high school students aged 15-18 years ( $16.6 \pm 1.1$  years) studying during the academic year 2013–2014 in the Minudasht city, Golestan Province (Iran), were selected. We chose female students of this particular age because they are more vulnerable to loneliness and depression. Of these 3201 students, 301 were selected using multistage random sampling. Initially, four high schools were randomly selected from all high schools, and then three classes were randomly chosen from every high school. All 301 students completely filled the questionnaires after providing written informed consents for participation in this study. This study was approved by the Ethics Committee of the School of Psychology, Semnan University. According to Bentler (25) to perform tests at a statistically significant level, the sample size should be 5 to 50 times more than the free parameters in basic matrices. Since there were 16 parameters in the basic matrices of the present study, the population size of this work was 301 subjects.

### Instruments

**The Network of Relationships Inventory-Relationship Quality Version (NRI-RQV):** This scale is one of the three versions of the Relationships Network Questionnaire (26). NRI-RQV consists of 30 items and 10 subscales, which further include three items each. The scale measures five positive qualities (companionship, disclosure, emotional support, approval, and satisfaction) and five negative qualities (conflict, criticism, pressure, dominance, and exclusion) in interpersonal relationships. The responses are calculated on a five-point Likert scale ranging from "never" (1) to "always" (5), and the score of each subscale is calculated by ob-



**Figure 1.** The conceptual model between quality of relationships, coping strategies, loneliness, and depression

taining the mean of three items of that given subscale (a score between 1 and 5). The total score for positive and negative qualities is calculated by obtaining the mean of positive and negative subscales. A high score indicates that the given quality is higher (for example, support or conflict) in interpersonal relationships. The scale measures the quality of relationships with an individual's mother, father, siblings, same-sex friends, opposite-sex friends, and romantic partners. Due to cultural considerations, opposite-sex friends and romantic partners were omitted from this study and only the other four groups were evaluated. The validity and internal reliability (with Cronbach's alpha between .82 and .93) have been demonstrated in previous works (27,28). In this study, the scale was first translated into Persian and then back translated into English. Due to cultural considerations, some of the items were adapted. The values of the Cronbach's alpha for the positive and negative qualities were estimated to be .90 and .94, respectively.

**Ways of Coping Questionnaire (Lazarus and Folkman):** This scale, originally developed by Lazarus and Folkman in 1988, includes 66 items and assesses eight coping patterns. This scale consists of two broad categories, including problem-focused coping strategies (seeking social support, responsibility, planful problem-solving, and positive reappraisal) and emotion-focused coping strategies (confronting, distancing, escape-avoidance, and self-controlling). The Likert scale of this questionnaire ranges from "Not Used" (0) to "Used A Great Deal" (3). Lazarus reported the internal consistencies of this questionnaire to be 0.66 and 0.79 for problem-focused and emotion-focused coping strategies, respectively. In comparison, Rajabi Damavandi et al. (29) reported the Cronbach's alphas to be 0.79 and 0.72 for problem-focused and emotion-focused coping strategies, in this study, Cronbach's alphas were 0.81 and 0.75 for problem-focused and emotion-focused coping strategies, respectively.

**Children's Loneliness Scale:** This scale includes 24 items that assess loneliness in children and adolescents felt over the past 2 weeks. We included 16 items that assess the feelings of loneliness while excluded the other eight items related to interests to minimize the time needed to complete the scale. The items are rated on a five-point Likert scale ranging from "not at all" (1) to "always" (5). Also, items no. 2, 5, 7, 11, 13, 15, 19, and 23 are reversely scored. The higher the score obtained, the higher the individual's loneliness. In Vellymalay's research, the Cronbach's alpha value was estimated to be 0.88 (30). Hossein et al. (12) reported that the Cronbach's alpha and Guttman's reliability coefficient were 0.81 and 0.79, respectively. Also, in a study by Rezaei et al. (31), who validated this scale on university students, the reliability coefficient obtained for the loneliness scale was 0.83. In the present study, the Cronbach's alpha for this scale was 0.84.

**Table 1.** Mean, SD, and correlation matrix of the observed variables

Variable		Mean	SD	1	2	3	4	5	6
1.	Problem-focused coping strategies	1.60	0.42	.82					
2.	Emotion-focused coping strategies	1.29	0.36	.56**	.75				
3.	Loneliness	2.31	0.73	-.26**	.80	.84			
4.	Depression	1.21	0.75	-.10	.24**	.66**	.82		
5.	Positive quality of relationships	3.52	0.56	.31**	.00	-.42**	-.27**	.94	
6.	Negative quality of relationships	2.19	0.52	.06	.23**	.40**	.34**	-.18**	.94

\*\*Reliability coefficients have been reported on the main diagonal of correlation matrix  
SD: standard deviation

**Depression, Anxiety, and Stress Scale (DASS-21):** The short-form version of this scale is a 21-item self-report questionnaire measuring the three emotional states of depression, anxiety, and stress (32). The depression subscale measures unhappy mood, lack of self-confidence, hopelessness, worthless life, lack of interest to engage in affairs, not enjoying the life, and lack of energy and power (33). The scores are on a four-point Likert scale ranging from “always” (3) to “never” (0). Cronbach's alphas for the total scale and three subscales of depression, anxiety, and stress were reported as 0.93, 0.88, 0.82, and 0.90, respectively (34). Sahebi et al (35) validated this test for Iranian subjects and determined the internal consistencies of its subscales for depression, anxiety, and stress as 0.77, 0.79, and 0.78, respectively. In the present study, Cronbach's alphas for the total scale and subscales of depression, anxiety, and stress were 0.91, 0.81, and 0.79, respectively.

### Statistical Analysis

The present work is a correlational study with data analyzed using the Statistical Package for the Social Sciences 19.0 software (IBM Corp.; Armonk, NY, USA) for Windows (36). Descriptive analyses were used to illustrate the demographic information. Moreover, structural equations were performed by LISREL 8.80 for Windows (Lincolnwood, IL: Scientific Software International, Inc) using the Maximum Likelihood Method (37).

## RESULTS

The subjects were studying in the first (23.3%), second (21.9%), and third grades (25.2%) of high school and in the pre-university course (29.6%). Table 1 presents the descriptive statistics and correlation indexes between the study variables.

Depression showed the greatest positive correlation with loneliness, followed by the correlation between the negative quality of relationships and depression, the correlation between the positive quality of relationships with depression, and the correlation between depression and emotion-focused coping strategies. Moreover, no significant correlation was found between problem-focused coping strategies and depression.

The internal relationships pattern of the variables was examined as a hypothetical model. To determine the contribution of each component and its direct and indirect effects, Path Analysis was applied. For this purpose, first, fitness indexes of the model were investigated; and found that the fitness of the initial model is not very suitable. In the initial model, the direct effects of the positive and negative quality of relationships on depression were not significant. Also, the problem-focused coping strategies did not have a direct effect on depression. Thus, these paths were omitted. However, there is some evidence on the lack of direct effect of the quality of relationships on depression (18).

To modify the model based on empirical evidence, three paths were added: Positive quality of relationships on emotion-focused coping strategies, negative quality of relationships on problem-focused coping strategies, and the direct effect of problem-focused coping strategies on loneliness (11,38,39). These paths were added according to the literature review.

After modifying the model, the model fitness indexes were reinvestigated. Since the fitness indexes of the final model (Figure 2) were found to be in a desirable range (Table 2), the final model is concluded to have appropriate fitness. Overall, the model explains 45% of the variance for depression. The indirect effect of the positive quality of relationships on depression mediated through loneliness was found to be statistically significant (Indirect Effect  $_{POS-ASH-DEP}^1 = -0.25$ , Sobel $_{test} = -5.35$ ,  $p < .001$ ). The total effect of the positive quality of relationships on depression was significant ( $TE = -0.296$ ,  $p < .001$ ). Moreover, the indirect effect of the negative quality of relationships on depression through loneliness was significant ( $IE_{NEG-ASH-DEP}^2 = 0.33$ , Sobel $_{test} = 6.60$ ,  $p < .05$ ). The indirect effect of the negative quality of relationships on depression through emotion-focused coping strategies was significant ( $IE_{NEG-EMO-DEP}^1 = 0.04$ , Sobel $_{test} = 2.63$ ,  $p < .01$ ). The total effect of the negative quality of relationships on depression was significant ( $TE = 0.375$ ,  $p < .001$ ). In addition, there was a positive and significant path from the problem-focused coping strategy to the emotion-focused coping strategy with a path coefficient of 0.50 ( $p < .0001$ ) and there was a negative and significant path from the problem-focused coping strategy to loneliness with a path coefficient of  $-0.32$ ,  $p < .001$  (Table 3).

## DISCUSSION

In the present study, the direct and indirect effects of the positive and negative qualities of relationships mediated by problem-focused and emotion-focused coping strategies and loneliness on depression were measured among female high-school students. Our analysis indicated that the data fit well with the model; loneliness is a stronger predictor of depression compared with emotion-focused coping strategies; and problem-focused coping strategies and loneliness play a mediating role between the positive and negative qualities of relationships and depression.

These results indicate that the positive and negative qualities of relationships do not have a direct effect on depression. These findings are consistent with those of the study performed by Jin et al. (18) indicating that interpersonal context does not have any direct effect on depression; but inconsistent with the results of the research conducted by Restifo and Bögels (9) and McLeod et al. (8) who argued that the warm relationship between the parent - child has the negative correlation with depression. They are also inconsistent with the results of Gadassi and Rafaeli (40) who reported that interpersonal difficulties have a role in the etiology of

**Table 2.** Fitness Indexes of the models

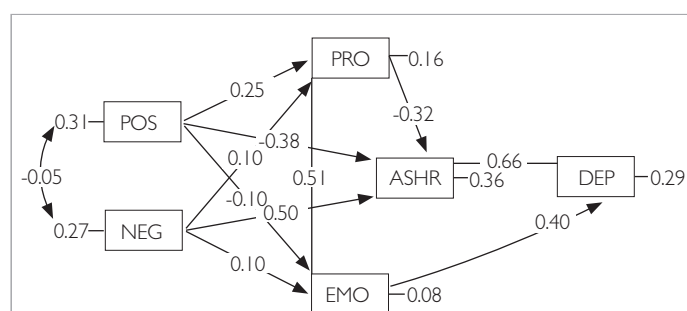
Model	$\chi^2$	df	$\chi^2/df$	GFI	NFI	RFI	IFI	AGFI	CFI	NNFI	RMSEA
Initial	24.02	5	4.8	0.947	0.948	0.843	0.958	0.891	0.957	0.871	0.113
Final	11.78	5	0.235	0.987	0.975	0.924	0.985	0.946	0.985	0.954	0.06
Acceptable values	-	-	<5	≥0.95	≥0.95	≥0.90	≥0.90	≥0.95	≥0.95	≥0.95	0.05–0.08

df: degree of freedom; GFI: Goodness of Fit Index; NFI: Normal Fit Index; RFI: Relative Fit Index; IFI: Incremental Fit Index; AGFI: Adjusted Goodness of Fit Index; CFI: Comparative Fit Index; NNFI: Non-Normed Fit Index; RMSEA: root mean square error of approximation

**Table 3.** Direct, indirect, and total effects of the variables on each other

Path	Direct effect	Indirect effect	Total effect
Problem-focused on emotion-focused	0.51	0	0.51
Problem-focused on loneliness	-0.32	0	-0.32
Positive quality on problem-focused	0.25	0	0.25
Positive quality on emotion-focused	-0.10	0.12	-0.22
Positive quality on loneliness	-0.38	-0.08	-0.46
Negative quality on emotion-focused	0.10	0.05	0.15
Negative quality on problem-focused	-0.10	0	-0.10
Negative quality on loneliness	0.50	0.03	0.53
Loneliness on depression	0.66	0	0.66
Emotion-focused on depression	0.40	0	0.40
Problem-focused on depression	0	-0.21	-0.21
Positive quality on depression	0	-0.35	-0.35
Negative quality on depression	0	0.41	0.41

df: degree of freedom; GFI: Goodness of Fit Index; NFI: Normal Fit Index; RFI: Relative Fit Index; IFI: Incremental Fit Index; AGFI: Adjusted Goodness of Fit Index; CFI: Comparative Fit Index; NNFI: Non-Normed Fit Index; RMSEA: root mean square error of approximation

**Figure 2.** The tested model between positive and negative qualities of relationships and depression

POS: positive relationship; NEG: negative relationship; PRO: problem-focused; EMO: emotion-focused; ASHR: loneliness; DEP: depression

depression and its maintenance and recurrence. A possible explanation for these inconsistencies is that in the present study we considered the interpersonal relationships of the adolescents with their parents, siblings, and friends as a single structure.

Another finding of this study is that the negative quality of relationships has a significant indirect effect on depression through loneliness. These findings are in agreement with those of the research by Rabbai et al. (13), Rokach et al. (14), and Boivin et al. (16). Another possible explanation for this consistency is that negative relationships with others cause loneliness because rejection and lack of relationships with others might reduce the

sense of social value (15). Loneliness might, in turn, lead to different internalized problems such as depression and anxiety. Also, the results of the present study show that the negative quality of relationships has a significant indirect effect on depression through emotion-focused coping strategies. This finding is consistent with the studies conducted by Faramarzi et al. (23) and Gonzales et al. (20). It can be argued that when facing stressful conditions and interpersonal problems using inefficient emotion-focused coping strategies such as avoidance and distancing, an individual somehow denies having any stress and using this strategy increases the internalizing disorders, including depression.

In the present study, positive and negative qualities of relationships had significant indirect effects on depression through problem-focused and emotion-focused coping strategies. These findings are in accordance with those reported by Tyssen and Vaglum (38) and Lengua et al. (39). Moreover, Jin et al. (18) demonstrated that family atmosphere affects depression through problem-solving strategies. It can be argued that using problem-solving strategies an individual can adjust his/her inappropriate and stressful family and social conditions or can exacerbate them such that it eventually results in depressive symptoms.

Also, problem-focused coping strategies were detected with a direct impact on emotion-focused coping strategies. This finding is in line with the study by Faramarzi et al. (23) who reported that using a problem-focused coping strategy along with an emotion-focused coping strategy depends on regulative effects and these two have a mutual relation. In this case, when an individual is facing a mental pressure they first calm themselves applying their own emotion-focused coping strategy. Next, using a problem-focused coping strategy, they attempt to solve their problem by suppressing their emotion through their cognition. Another finding was that problem-focused coping strategies have a direct effect on loneliness. This finding is in accordance with those reported by Anderson (22) and Peplau et al. (11). In fact, it can be argued that individuals who apply problem-focused coping strategies, when facing stressful conditions (such as constructive actions aiming at removing or changing the source of stress or tension), experience less loneliness compared to those individuals who use passive strategies (24).

It can be concluded that negative and positive qualities of relationships can cause depressive symptoms in adolescents through variables such as coping strategies and loneliness. Indeed, interpersonal relationships with others such as parents, siblings, and peers with positive qualities and decreased social distance satisfy the individuals' need for attachment and lead to a decreased loneliness in individuals (3). In addition, in accordance with the findings of the present study and previous studies, loneliness has a positive and significant relationship with depression. Negative relationships with family and peers can also endanger individuals' mental health through loneliness. Finally, negative interpersonal relationships can result in depressive symptoms in adolescents through the same mechanism. These findings emphasize the importance of negative interpersonal relationships in individuals' psychological health.



According to these results, to decrease loneliness in adolescents through teaching the interpersonal skills it is necessary to make relationships with positive qualities, which can be effective in reducing depressive symptoms. The importance of interpersonal relationships in depression has been also shown in Neshatdoust's study implying that depression has a significant negative correlation with relationships with parents and feelings of intimacy and closeness to them, with positive relationships with siblings, and with relationships with friends (41). Also, Hisli Sahin et al. (42) showed a relationship between depression and interpersonal style. Moreover, the findings of the present study suggest that positive and negative interpersonal relationships through problem-focused and emotion-focused coping strategies might be correlated with depressive symptoms. Indeed, when encountering stressful interpersonal conditions, an individual can adjust inappropriate and stressful family and social conditions using emotion-focused and problem-focused coping strategies and/or exacerbate them, which would result in depressive symptoms. These findings emphasize the necessity of teaching coping strategies to adolescents for facing stressful conditions.

The first limitation of the present study relates to its design. Since the relations extracted among the variables are a type of correlational relation, no causal inferences can be made based on them. The second limitation relates to the measurement method. The use of questionnaires and self-report measurements has a number of inherent difficulties, including lack of self-insight, measurement errors, etc. Another limitation relates to the study population. The subjects of this study are female students from Minoudasht; hence, the results can only be generalized to the intended population. Another limitation is related to the NRI-RQV. Due to cultural considerations, questions about opposite-sex friends and romantic partners were omitted from the study, and this affects the construct validity adversely. Accordingly, it is suggested that researchers apply other designs in future studies such that the extracted relations can be examined in terms of causal correlations. Also, it is suggested applying other data collection methods to derive some evidence for expanding the measurement methods. Finally, it is recommended replicating this work on boys and in other parts of the country to extract some evidence for expanding the structural relations of the model.

**Ethics Committee Approval:** Ethics committee approval was received for this study from the ethics committee of Semnan University School of Psychology and Educational Sciences.

**Informed Consent:** Informed consent was obtained from students who participated in this study.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept - E.A., S.T.; Design - E.A., S.T.; Supervision - S.T.; Resource - E.A., S.T.; Materials - S.T., A.R.; Data Collection and/or Processing - E.A., S.T.; Analysis and/or Interpretation - E.A., S.T.; Literature Search - E.A.; Writing - E.A., S.T.; Critical Reviews - S.T.

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